

**CLAIMS**

1. An olefin oligomerization process comprising:
  - (a) contacting a feedstock comprising one or more  $C_2$  to  $C_6$  n-olefins and from about 0.5 wt% to about 25 wt% of an iso-olefin under oligomerization conditions with surface-deactivated ZSM-23 to produce an oligomerized olefin product having a  $C_{12+}$  fraction containing less than 0.5 atom % of quaternary carbon atoms; and
  - (b) separating from said oligomerized olefin product such  $C_{12+}$  fraction.
2. The process according to claim 1, wherein said iso-olefin is iso-butylene and/or iso-amylene.
3. The process according to any preceding claim, wherein said one or more n-olefins in the feedstock are selected from propylene, n-butene and mixtures thereof.
4. The process according to any preceding claim, wherein said feedstock is the unreacted effluent stream from an MTBE unit.
5. The process according to any preceding claim, wherein said feedstock contains less than 100 ppm of dimethyl ether.
6. The process according to any preceding claim, wherein said feedstock has a sulfur content of less than 10 ppm.
7. The process according to any preceding claim, wherein said ZSM-23 has been surface deactivated with a sterically hindered nitrogenous base.

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8. The process according to Claim 7, wherein said sterically hindered nitrogenous base is 2,4,6-collidine.
9. The process according to any preceding claim, wherein said oligomerization conditions include a temperature of 160 to 250°C.
10. The process according to any preceding claim, wherein said oligomerization conditions include a temperature of 190 to 230°C.
11. The process according to any preceding claim, wherein said oligomerization conditions include a temperature of 210 to 220°C.
12. The process according to any preceding claim, wherein said oligomerization conditions comprise a pressure in the range of from 500 psig (3447 kPa (gauge)) to 1500 psig (10342 kPa (gauge)).
13. The process according to any preceding claim, wherein said oligomerization conditions comprise a pressure in the range of from 750 psig (5171 kPa (gauge)) to 1250 psig (8618 kPa (gauge)).
14. The process according to any preceding claim, wherein said oligomerization conditions comprise a weight hourly space velocity of from 0.1 hr<sup>-1</sup> to 4.0 hr<sup>-1</sup>.
15. The process according to any preceding claim, wherein said oligomerization conditions comprise a weight hourly space velocity of from 0.2 hr<sup>-1</sup> to 3.0 hr<sup>-1</sup>.
16. The process according to any preceding claim, wherein said oligomerization conditions comprise a weight hourly space velocity of from 1.75 hr<sup>-1</sup> to 2.25 hr<sup>-1</sup>.

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17. The process according to any preceding claim, wherein said  $C_{12}+$  fraction has an average of from 0.8 to 2.0  $C_1$ - $C_3$  alkyl branches per carbon chain.
18. The process according to any preceding claim, wherein said  $C_{12}+$  fraction has an average of from 0.8 to 1.3  $C_1$ - $C_3$  alkyl branches per carbon chain.
19. A method for producing a long chain alcohol mixture comprising contacting the  $C_{12}+$  fraction produced by the process of any preceding claim with carbon monoxide and hydrogen under hydroformylation conditions and in the presence of a hydroformylation catalyst.
20. A method for producing an alkylaromatic compound comprising contacting an aromatic compound with the  $C_{12}+$  fraction produced by the process of any one of claims 1 to 18 under alkylation conditions and in the presence of an alkylation catalyst.
21. A method for preparing an alkylaryl sulfonate by sulfonating the alkylaromatic compound produced by the method of Claim 20.

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